ENGINEERING NEWS-RECORD

Traffic circle on Okinawa built by the Seabees less than six weeks after invasion.

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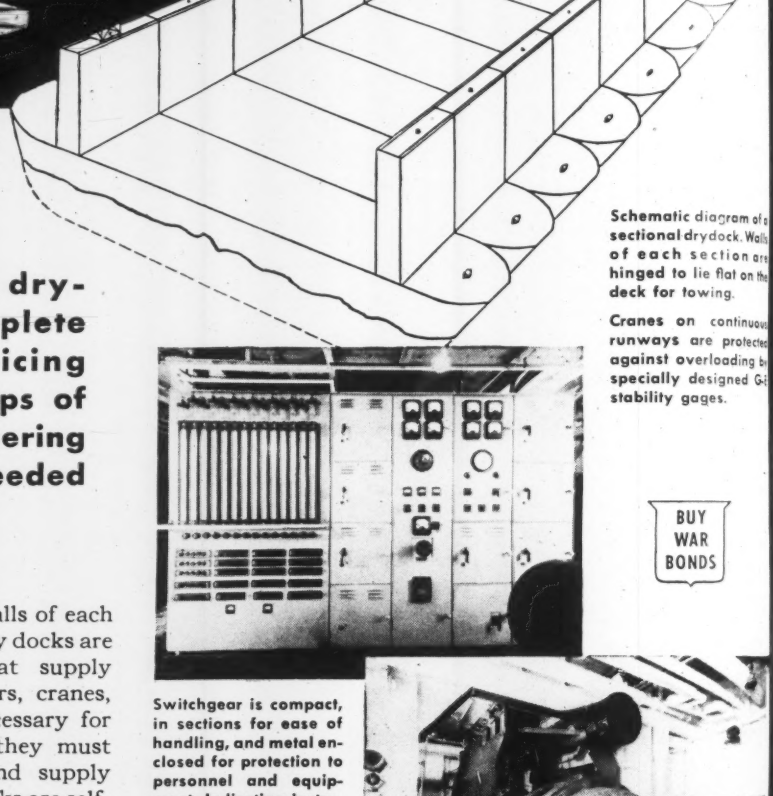
FIRST AID STATION for FIGHTING SHIPS

Ten-section floating drydock servicing a battleship somewhere in the Pacific. (Official U. S. Navy Photo)

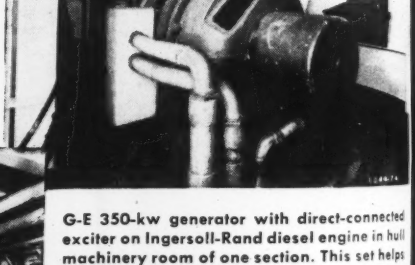


Schematic diagram of a sectional drydock. Walls of each section are hinged to lie flat on the deck for towing.

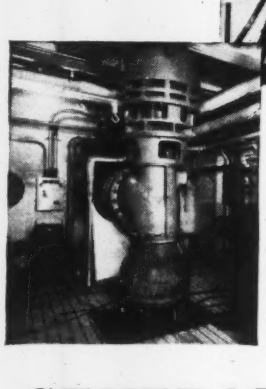
Cranes on continuous runways are protected against overloading by specially designed G-E stability gages.

Sectional, floating drydock provides complete facilities for servicing even the largest ships of our Navy. G-E engineering and equipment speeded this program.

Switchgear is compact, in sections for ease of handling, and metal enclosed for protection to personnel and equipment. Indicating instruments enable operator to determine water level in ballast chambers when dock is being raised or lowered.



G-E 350-kw generator with direct-connected exciter on Ingersoll-Rand diesel engine in hull machinery room of one section. This set helps supply power for pump motors of all types, and motors on air compressors, ventilating fans, refrigerating units, capstans, and anchor windlasses.



One of the four dewatering pumps located in each section to control bouyancy. The G-E motors are controlled from the switchgear station shown above.

BUY WAR BONDS

WITHIN the hull and wing walls of each section of these ocean-going dry docks are compact diesel generating sets that supply electric power for the pumps, welders, cranes, and all other electric machinery necessary for refitting battle-torn ships. Because they must operate far from friendly shores and supply bases, these many-compartmented docks are self-contained. Placed together, ten of the sections, of the type shown here, will float a battleship. As the sections are joined mechanically they are also tied together electrically. Synchronizing facilities are provided for multiple operation of any number of sections.

General Electric has been responsible for the design and manufacture of electric equipment for almost the entire program. The installation photos here show the compact arrangement of generators, motors, and control—the same type of equipment that construction men have found successful in many projects on land as well as on the sea.

At General Electric your project will receive the same careful consideration. You can count on sound engineering such as went into these floating drydocks—an important factor in *your* favor. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

The Week In Engineering and Construction

ENGINEERING NEWS-RECORD • AUGUST 16, 1945 • VOLUME 135 • NUMBER 7

Relaxation of controls on construction announced

Victory over Japs brings modification of Order L-41 to encourage industrial plant expansion and major increase in highway building without WPB authorization

Even before the Jap surrender was officially announced on August 14, the War Production Board relaxed controls on industrial plant expansion and highway work. As a result extensive industrial construction can be started immediately and definite decisions made to permit a large amount of additional construction to be started soon. In addition, many projects shut down because of older provisions of Order L-41 can now go forward due to a new direction to this control.

Within the next few weeks there is good likelihood that further relaxations will be granted, with the probability that the L-41 order will be eliminated entirely. Greatest present relaxation results from amendment of Direction 5 to L-41. A few weeks ago this control was modified to provide for increased construction of three general classes of manufacturing facilities (see *ENR* May 31, 1945, vol. p. 747 for details). These three classes are: additions to or alterations of existing facilities for making civilian products; construction for production of bottleneck materials or components; and building work needed for essential civilian production.

More building without priority

Recognizing the urgency of completing industrial and other types of construction authorized without general priority assistance, Direction 5 has now been further amended to permit applications for assistance on bottleneck items for projects initially approved without such assistance. This amendment is aimed at providing a maximum of immediate employment by the manufacturing industry.

With the new relaxation and assistance three types of projects are authorized without general priority, namely: Projects that will provide additional manufacturing facilities; those involving public transportation, health and safety; religious and educational activities that do not quite meet the criteria for facilities for essential civilian services; and those for which materials, equipment and other resources required are on hand or readily available without priorities assistance.

Limit on road jobs raised

Public highway and street construction projects costing up to $100,000 may now be undertaken without WPB authorization, because of the relaxation of L-41-E. Formerly, projects exempt from the necessity of obtaining WPB authorization were those costing not more than $10,000 or those costing $5,000 or less per mile if the total amount of the work did not exceed $25,000.

Also, now, specific orders issued by WPB to stop construction of public highway or street projects, including provisions forbidding delivery of materials, are revoked if the work necessary to complete the project is covered by one of the present exemptions to L-41-E or any subsequently established exemption.

However, the revocation does not reinstate priorities assistance previously granted. For example, a stop construction order is revoked if the cost of completing the work is within the new $100,000 exemption from authorization.

As a further aid to get a large construction program started the WPB has issued Direction 6 to Order L-41 to permit many construction projects halted to be resumed.

Marine Corps photo

Traffic circle speeds operations on Okinawa

This large traffic circle on Okinawa is the work of a Seabee battalion, which designed and built the road in less than six weeks after our invasion forces landed on the island.

The project was built under the most adverse conditions, as 20,000 vehicles daily passed over the road while it was under construction. However, this did not delay the Seabees, and the work was carried to completion within the time allotted.

Huge public works program readied as Federal agencies gear for peace

Problems of transition from war to peace economy may cause some delay, however, in translating plans into action

News of the Jap surrender opened desk drawers and loosened the tongues in a dozen Federal agencies that will play an important role in furthering postwar construction, and it became apparent that well-laid plans for action have long been under consideration.

Translated in terms of public works projects, the situation reveals that hundreds of thousands of job opportunities will be provided, but spokesmen warned that this eventuality will require time. Greatest concern at the moment is how to gear these public works plans into the mesh of transition measures that surround every phase of governmental and private activity.

Major programs of civil work will be undertaken by the Army Engineers, the Bureau of Reclamation and the Public Roads Administration. A brief outline of these programs, as well as those of other agencies, follows:

Corps of Engineers—As a result of pre-war investigations and planning, and that which the U. S. Army engineers has been able to accomplish during the war, the corps now has a potential backlog of beneficial federal improvements in the interests of navigation, flood control, and other water uses totaling 4.5 billion dollars.

Of this amount, $3,445,000 has been authorized by Congress, and the balance of the program represents economically justified projects which have been submitted to Congress for final action. Of the total program authorized by Congress, detailed construction plans and specifications are now ready for a volume of work estimated to cost over a half-billion dollars.

Present schedules contemplate completion of plans and specifications by the end of the year on projects totaling $800,000,000. Although $14,635,000 was made available for planning during the fiscal year 1946, which ends June 30, only $58,000,000 is available for construction, this money having been earmarked for war projects.

Public Roads Administration—Termination of the war will be the signal for full-scale activity on national roadbuilding. The Federal-Aid Highway Act of 1944 authorized $500,000,000 for each of the first three postwar years. The yearly fund is divided: $225,000,000 for the Federal-Aid system, either urban or rural portions; $125,000,000 for urban portions of the Federal-Aid system; and $150,000,000 for a system of secondary or farm-to-market roads. Portions of the first two amounts will be used for a beginning on a 40,000-mile system of national interstate highways now being designated.

Construction contracts may be awarded immediately following proclamation by the President of termination of the war, or similar action by concurrent resolution of the two houses of Congress, or passage of a concurrent resolution finding that the emergency has been relieved.

The $500,000,000 for the first year has already been apportioned among the states, and a considerable volume of plans has been completed by the states. On August 1 the states reported completed plans for work estimated to cost $616,000,000 and planning was under way for work to cost two and one-half billion dollars.

Federal-aid authorizations for previous years, now frozen, but to become available on termination of the emergency amount to $107,000,000.

Termination of the emergency will also make available other new funds as follows: $37,500,000 for roads in national forests; $4,250,000 for national park roads; $10,000,000 for parkways; and $6,000,000 for access roads to Indian reservations. These are for the first postwar fiscal year, and similar amounts are authorized for each of the two following years.

Bureau of Reclamation—End of the Pacific war finds the bureau with a total of $60,000,000 available for construction, and a program totalling 1.3 billion dollars authorized.

With this money work underway as part of the Central Valley Project will be expedited. This will include construction of the Friant-Kern Canal for which a contract of $1,163,340 for a 5.6 mi. section was just awarded, operations on the Contra-Costa Canal and remaining construction at Friant, Keswick and Shasta dams.

Operations already underway as part of the Colorado-Big Thompson project and the Columbia Basin Development will also be expedited. In addition, Davis Dam on the Colorado, which was shut down because of the war, will be advertised for bids this fall with work expected to start early next year.

Because bureau funds were appropriated on the basis that both wars would continue until the end of the fiscal year, 1946 (June 30, 1946), an early request will probably be made for additional construction money.

Federal Works Agency—Aside from the highway-building program mentioned elsewhere in this roundup, the war finale finds the Federal Works Agency without authorization to make any considerable contribution to economic stability in the transition period. However, the Bureau of Community Facilities is making loans and advances to the states and their political subdivisions to assist in financing the planning of state and local public works. For this purpose $17,500,000 was appropriated although the original request was for $75,000,000; already, of this sum, $2,000,000 has been committed for the planning of about 170 projects.

The Public Buildings Administration looks forward to a large volume of postoffice and other federal building construction.

The extent to which the resources of FWA are to be utilized in the reconversion period thus awaits, very largely, the decision of Congress. Lanham Act war emergency construction is coming to an end, but the need for maintenance and operation assistance, especially for schools, is likely to persist for several months more, according to Maj. Gen. Philip B. Fleming, administrator.

Civil Aeronautics Administration—A billion dollar airport program, modernization of the 37,000 miles of airways with ultra high frequency radio aids and radar, and assistance to the industry in the development of personal aircraft are the principal jobs in view for the civil aeronautics administration for the immediate postwar years.

Pending in Congress are two bills

(*Continued on page 7*)

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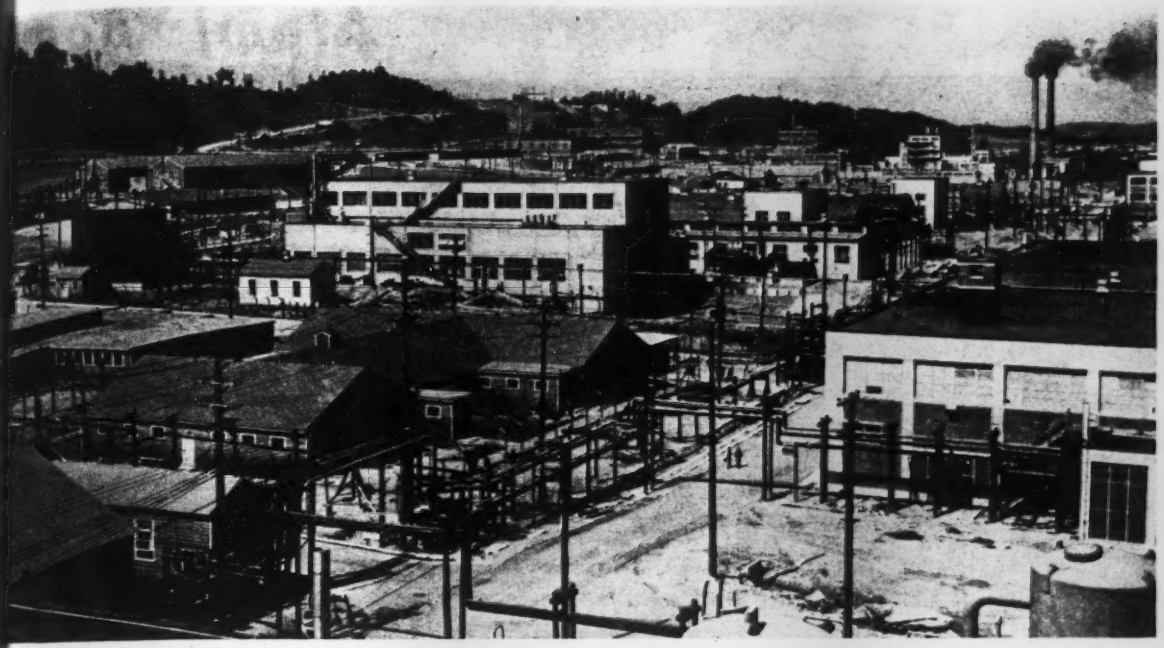


Manufacturing center for the atomic bomb at the Clinton Engineer Works, Oak Ridge, Tenn., covers 59,000 acres.

Atom-Bomb Plants Tested Builders' Skill

Hal W. Hunt
Associate Editor, Engineering News-Record

Oak Ridge, Tenn.—Civil engineers d contractors played a vital role in e production of the atomic bomb. It s through their skill that the plans the scientists were rapidly trans- ed into huge plants for the processing uranium.

The work has been done under a ecial "Manhattan District" of the rps of Engineers. Under Maj. Gen. slie R. Groves, an Engineer officer. e district operated secretly and al- st independently of the regular corps organization except in procurement of needed materials.

A few outstanding firms were selected to design, build and operate the plants as prime contractors under a fixed-fee agreement. In turn, these firms subcontracted part of the work to specialist organizations and thus augmented their capacity for rapid completion of what is unquestionably one of the greatest construction jobs ever undertaken.

The three projects for the development of the atomic bomb included a testing station near Sante Fe, N. Mex., and manufacturing centers in Washington (Hanford Engineer Works) and Tennessee (Clinton Engineer Works). It is reported that $106 million was spent at the Clinton Engineer Works, $382 million at the Hanford Engineer Works, $54 million at the Santa Fe station and $122 million elsewhere making a total for the project of $1,665,000,000.

At the huge development in Tennes-

(More pictures on next two pages. Text continued on page 61)

Gen. Groves

Col. Nichols

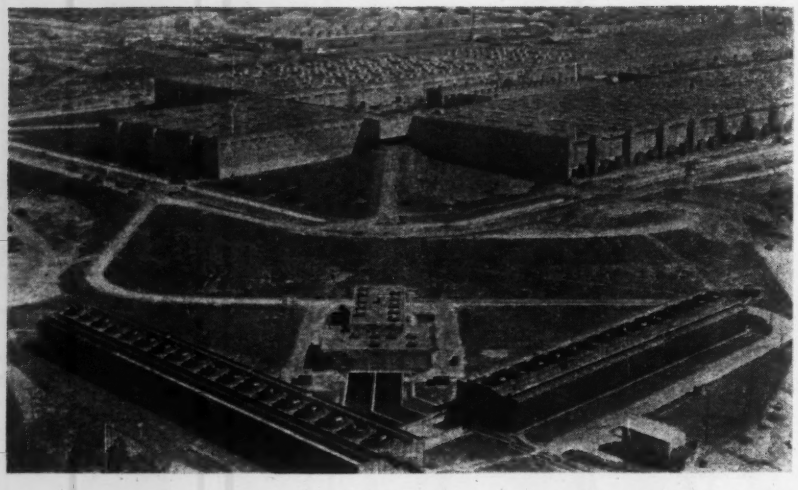
Col. Matthias

Gen. Farrell

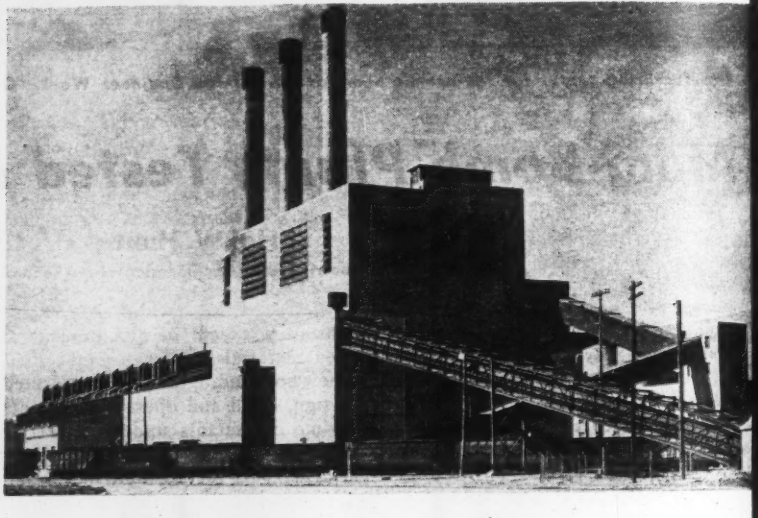
ol. Gen. Leslie R. Groves, in charge of the governments' atomic bomb project, was aided by Col. Kenneth D. Nichols, istrict engineer of the Manhattan Engineer District, and Col. Franklin T. Matthias, commanding officer of the Han- rd Engineer Works. Brig. Gen. Thomas F. Farrell was assistant to General Groves.

Atomic Bomb

Clinton Eng. Works
Oak Ridge, Tenn.



One of the main process plants Clinton Engineer Works. Structures foreground appear to be water cooler

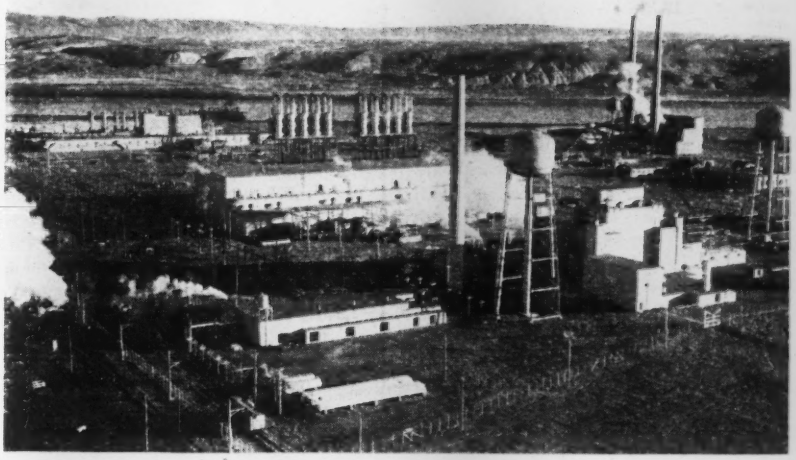


Steam power plant of 238,000 kw. capacity at Clinton Engineer Works, the first unit of which went into operation in ten months after start of construction.

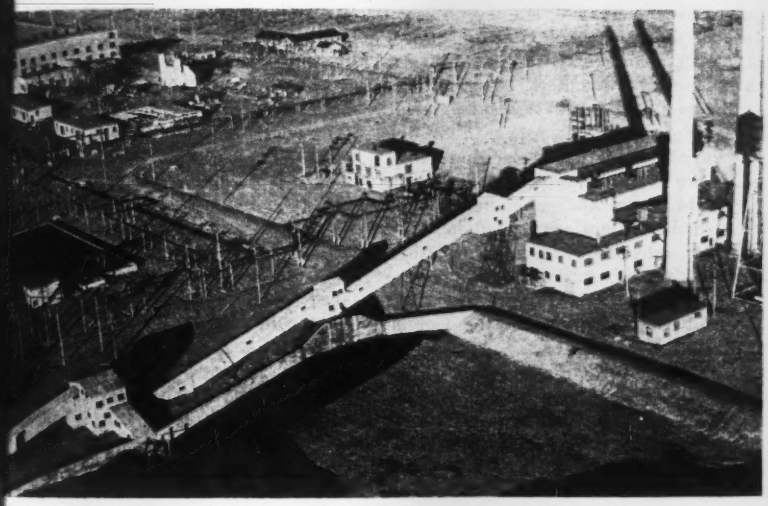
"Village" of Oak Ridge, which h 75,000 inhabitants and is fifth large town in Tennessee. Note pre-bui trailer-delivered type of houses at rig

Plant Facilities

Hanford Eng. Works
Pasco, Wash.



e Hanford Engineer Works at Pasco, ash., occupies 430,000 acres.



One of process plants at Hanford. Appearance indicates that this plant may be used to process ore but no information has been released on it.

he town of Richland with a population of 17,000 comprises the housing nd business development for the Hanford Engineer Works.

(*Continued from page 3*)

see, near Knoxville, which I visited last week, two large production areas, one small plant and the city of Oak Ridge with a population of 75,000 make up the Clinton Engineer Works.

Each of the three plants is used for concentrating uranium (U-235) by a different process, all giving somewhat the same product, though current dispatches from the fighting front indicate that some are more destructive than others when used in bombing.

One of the large plants uses what is known as the gaseous diffusion process. Essential steps of this process are carried on in a huge building laid out in the shape of a letter U. This building is 2,450 ft. long on each side, 400 ft. in width, 60 ft. high and has a total floor area of 5,568,000 sq. ft. Some 70 additional buildings housing supplemental services are in the immediate area, which covers a total of some 600 acres.

This plant was designed by the Kellex Corp., a subsidiary of the M. W. Kellogg Co., and constructed by the J. A. Jones Construction Co. Edwin Jones is general manager for the latter firm and John D. Watson is chief engineer. The plant is operated by the Carbide and Carbon Chemicals Corp.

Construction of the main process works started Sept. 10, 1943, and the first units began operating Feb. 20, 1945. Forces of J. A. Jones Construction Co. on this work reached 25,000 in May, 1945.

In the gaseous diffusion process plant area Ford, Bacon and Davis, New York City, designed and constructed a "conditioning" building with 800,000 sq. ft. of work area on a first floor and basement. This plant "conditions" all equipment before installation in the process buildings.

Electromagnetic plant

At an entirely separate plant a completely different method is used for separation of uranium atoms by electromagnetic means following the theory of the cyclotron developed by Prof. Ernest O. Lawrence of the University of California.

This plant has a total of 270 buildings, including five main chemistry buildings. Construction of the plant began in February, 1943, and the first units were placed in operation in January, 1944. Time did not permit experimental operation of a pilot plant. Instead, the mammoth electromagnetic plant was built without precedents and it involved problems of construction and design never before encountered.

Stone and Webster was selected to design and build the plant. T. R. Thonburg is now in general charge for the builders. General Electric, Westinghouse and Allis-Chalmers were the major suppliers of equipment. The Tennessee Eastman Corp. was selected to operate the plant. Electric power, supplied largely by the Tennessee Valley Authority, is used in the process.

Thermal diffusion plant

In addition to the two large plants at the Clinton Engineer Works there is a "little plant" that uses the thermal diffusion method for concentrating U-235 uranium.

The plant comprises about 20 structures. The largest building is 525 ft. long, 75 ft. high and 82 ft. wide. Construction was begun July 13, 1944, and completed Dec. 15, 1944. Its first unit started operating, however, on Oct. 13, just three months to a day from the start of construction. Priority and importance of this plant are shown by the fact that the main steel for the building was approved one day, ordered the next and rolled on the third day.

Research and development work for the plant was done by the United States Naval Research Laboratory and it was designated and constructed by the H. K. Ferguson Co., of Cleveland, Ohio, under C. W. Roberts. It is operated by the Fercleve Corp., an affiliate of the Ferguson Co.

A huge powerhouse was constructed in the gaseous diffusion process area with a capacity of 238,000 kw., the largest initial single installation of its kind ever built. It has three giant boilers, each producing 750,000 lb. of superheated steam per hour. The power plant was designed by Sargent and Lundy and constructed by the J. A. Jones Construction Co.

A construction camp, separate from the main town of Oak Ridge, was built to house 10,000 workers, many with their families. Facilities include water supply and sewerage installation for the equivalent of a city of 50,000. More than 4,000,000 cu. yd. of all classes of excavation was moved, 12,000,000 cu. yd. of crushed stone used and 450,000 cu. yd. of concrete placed.

Some 1,000,000 cu. yd. of the earth was moved to make way for the main buildings in a 2,600 x 1,200-ft. area. Fill under the buildings was placed in thin layers and compacted to support the heavy buildings on spread footings.

Hanford Site Related to Power

W. C. Heston
Pacific Coast Editor of Electrical World
Special to Engineering News-Record

Pasco, Wash.—Hanford Engineer Works visited by a McGraw-Hill editor two days after news of the atomic bomb broke revealed some information not already covered by the press. And an engineer observer viewing plants at a distance through wire fence barricades could make some deductions as regards power facilities and other physical aspects of the plants.

Hanford facilities appear to be for the purpose of producing U 235, which is an isotope of uranium of atomic weight 238 found in Canada and elsewhere in sufficient quantities for military purposes. Secrecy surrounds the process, but it would appear to be mechanical and chemical rather than electrical.

If bombardment by neutrons fires the bomb and heavy water is their source, it would appear that the heavy water is made elsewhere than at the Hanford works. Likewise, it would seem that the final bomb assembly is not performed here.

In selecting the site, isolation, water and a continuous power supply were stated requirements. Water involves pumping from the Columbia River and if an uninterrupted water supply was so important, then one might expect to find steam-turbine driven and motor-driven pumps operated in series. Quick-starting turbo-generators, similar to those used in oil refineries, might also logically be found. For these steam requirements each of the six large plants might have boiler plants possibly burning coal. Electric power supply is from the Midway Substation, located on the site, of the Bonneville Power Administration, with a 230,000-v. wood pole loop circuit feeding four substations.

Hanford Engineer Works was designed and built and is now operated by E. I. duPont de Nemours & Co. for the U. S. Army Engineers. Because of the urgency of the project, more than the usual wartime construction difficulties were encountered. Peak employment reached about 45,000, and an immense camp had to be constructed within the 400,000-acre site. A total of 780,000 yds. of concrete were cast and about 1,500,000 concrete blocks and 750,000 cement bricks were used in plant construction.

Huge public works

(*Continued from page 2*)

which will implement the plan proposed by the CAA for 3,000 new airports. These, with some 3,300 now in service, will serve the nation adequately in the years just following the war, and the CAA is ready and eager to have the construction job get started. Each of the bills includes a provision for $3,000,000 to be appropriated immediately for making local surveys, and this work can be started as soon as a bill is signed.

Construction of these airports probably could not be started at once, but it is estimated that actual jobs can be provided within 18 months on most of the projects. An estimated 1,250,000 man-months will be necessary to construct the airports, including buildings and necessary auxiliary facilities.

The CAA proposes in its plan, and both pending bills have adopted the proposal, that federal funds be matched with state or city funds in the construction of these fields.

U. S. Geological Survey—With its regular funds, the Geological Survey is expanding its investigations of the quantity and chemical quality of both surface and groundwater, and, in addition programs involving 15 additional objectives, at an estimated cost of $15,000,000 during a period of three years, have been formulated and are ready for immediate execution subject to congressional action. Such expanded programs take into acount the backlog of regular obligations that have had to be postponed because the Survey's facilities have been focused on war problems. Finally, funds have been provided by the Congress to initiate topographic surveys in the Columbia River and the Missouri River basins. Also there is increased activity in the state cooperative mapping programs as postwar undertakings, notably in California and Illinois.

Coast and Geodetic Survey—Activities of this agency having the most direct bearing on construction work are its geodetic control surveys. These provide basic data of value for highway and railroad construction, hydro-electric power development, flood prevention and conservation works, and other construction projects carried on by such government services as the Bureau of Reclamation and U. S. Engineers and by private agencies.

Furthermore, the survey will be able to resume its long-range program of surveys required for the construction and revision of marine and aeronautical charts and coastal topographic maps, largely interrupted in recent years, according to Rear Adm. L. O. Colbert, director.

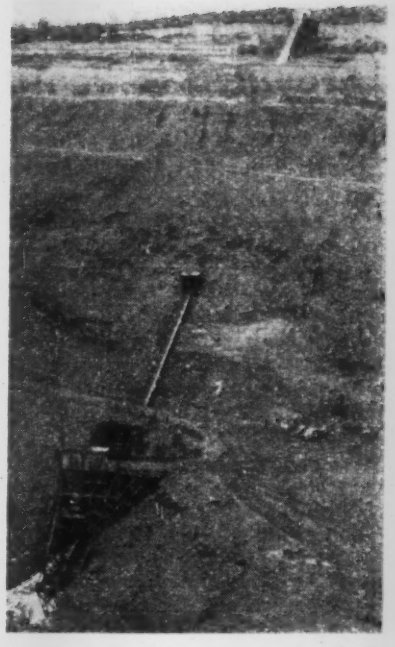
U. S. Public Health Service—Developed after two years of intensive study of national health needs, the ten-year postwar program of the U. S. Public Health Service calls for: (1) a sanitary environment for everyone; (2) a hospital system adequate for the provision of complete medical services; (3) expanded public health services throughout the country, (4) augmented research in the health and medical sciences; (5) training of sufficient health and medical personnel; and (6) a national medical care program.

Widescale construction of sanitary facilities and hospitals is indicated. The cost of providing adequate water supplies, sewerage, stream pollution abatement, pasteurization facilities and rural sanitation is estimated at three and one-half billion dollars. This work includes construction of 5,000 new water system and extension or improvement of 6,500 others; sewage facilities for 10,500 communities with a combined population of 30,000,000; safe water supplies and toilet facilities for some 5 million rural families and around 500 milk pasteurization plants in 34 states and territories.

To provide adequate hospital facilities will require the expenditure of about 2 billion dollars. Surveys show that hospital needs stand at 166,000 new and replacement beds in general hospitals; 191,000 in mental hospitals, and 60,000 in tuberculosis institutions. In addition, 2,400 health centers should be constructed in outlying rural districts. The cost of these facilities is broken down as follows: general hospitals, one billion dollars; mental hospitals, $575,000,000; tuberculosis institutions, $300,000,000; and health centers, $120,000,000.

National Housing Agency—This agency is now holding conferences with Army and Navy officials to determine the further need of housing projects that have been programmed within the last five or six months. In anticipation of Japan's quick surrender a survey was started and undoubtedly many projects now under construction will be discontinued or cancelled outright.

Veterans Administration—This administration is now operating hospitals providing 84,000 beds and has two construction programs under way to provide 57,000 beds during the fiscal years of 1946 and 1947. Future program is aimed at providing a total of 300,000 beds. The amount of construction required for this work is uncertain as some hospitals may be transferred to Veterans Administration from the Army and Navy. However, considerable work will be done and the total cost is expected to be an impressive figure with present prices based on a cost of about $7,000 per bed.



Greatest vertical belt lift

Said to have the greatest vertical lift of any single conveyor belt in the world is this unit in the Mesabi range open pit ore mine of the Charleston Iron Mining Co., in northern Minnesota.

With a total length of 1900 ft., the belt was manufactured by the B. F. Goodrich Co. The single conveyor supplanted a three-belt system, handled 1,250,000 long tons of ore in its first year.

The belt is a 30-in., eight ply synthetic cord construction with a 1/4 in. top, including transcord breaker, and has a 1/16 in. back cover. Conveyor is 947 ft., total lift 272 ft., incline 35.53 percent grade, speed 578 ft. per minute.

Quebec water power law in operation

A law creating a Department of Hydraulic Resources, adopted at the last session of the Quebec, Canada, legislature, has been declared in operation by proclamation of the lieutenant-governor.

The new department will have full control over all hydraulic resources of the province, and take over part of the activities of the Department of Lands and Forests. It will be under the jurisdiction of the same minister, John S. Bourque, for the time being.

The department's main duty will be to assure profitable development of the province's water powers, still the property of the Crown, for the benefit of the population.

Federal aid for vast housing program provided in Senate bill

Loans and grants are proposed for slum clearance and for the construction of 1,250,000 home units annually

An unprecedented housing program will come up for consideration in Congress soon after it reconvenes. It is designed to foster the construction of 1,250,000 new dwelling units annually in the postwar years or well over four times the prewar (1929-39) rate of 273,000. If attained, this rate would involve annual expenditures of five or six billion dollars.

Result of long study

The program came to Congress in the form of a bill (S. 1342) introduced in the Senate on Aug. 1 by Senators Wagner of New York and Ellender of Louisiana, members of the subcommittees on housing and urban redevelopment of the Senate Special Committee on Postwar Economic Policy and Planning that held hearings on the subject over a period of seven months. The subcommittee's findings were made public at the same time.

Twelve million units in decade

To eliminate the present overcrowding and meet the needs of new families, as many as 6,000,000 new dwelling units are expected to be required during the first postwar decade, the committee found. It was further estimated that during this period an equivalent number of existing dwellings will need to be replaced if a measurable improvement in the country's housing standards is to be accomplished. The committee therefore placed the reasonable construction goal for the first post-war decade at 1,250,000 units yearly. This volume compares with an average of 173,000 homes built yearly in the 1929-39 decade and is estimated to cost five to six billion dollars annually.

Local bodies must act

The major responsibility of getting this large program completed rests on the local governments, the committee said, but these agencies should be aided by well planned and comprehensive action on the part of the federal government. In taking this view the committee wrote, "Any federal program must insist that the initiative for all housing plans rest upon each local community and the people of that community. The need of housing should be determined locally. The necessary volume of public and private housing construction should be determined locally. The location of residential areas should be planned by local planning commissioners. If the people of a community take no interest in the problem, it is not for the federal government to impose a program upon them."

Permanency proposed for NHA

Features of the bill offering federal assistance are:

1. The National Housing Agency, now a temporary war organization, is made a permanent independent agency. Most federal government activity relating directly to housing is continued in this agency. The Federal Home Loan Bank Administration, the Federal Housing Administration, and the Federal Public Housing Authority are continued as constituent units of the NHA.

2. Loans can be made by NHA up to $50,000,000 in the first postwar year, increasing to $250,000,000 after five years, to permit cities to eliminate blighted areas and slums by redevelopment work. To further aid in this work, federal contributions of $4,000,000 in the first year and with annual increases of $4,000,000 up to a maximum of $20,000,000 would be permitted to aid the cities in acquiring land. A major purpose of this latter help would be to permit the local government agency to "write down" the cost of the land in selling it to private interests for redevelopment to provide rental housing for those able to pay reasonable rents.

3. Annual contributions are permitted to local government agencies for public housing for those of low incomes. A $22,000,000 total of yearly contributions or annual grants would be permitted in the first year. Increases of $22,000,000 each year are authorized up to $88,000,000 annually at the end of a 4-yr. period.

4. Expansion of the present federal insurance of direct investment in housing properties up to a limit of one billion dollars is authorized, the aim being to encourage large investments from insurance companies and like institutions in rental housing in urban areas. An annual return after depreciation and operating expenses of 2¾ percent on 50-yr. investments made in anticipation of not more than 3¼ percent return is planned.

5. Low-interest loans to be made for rural housing under the direction of the Department of Agriculture and the Department of the Interior are provided for and a $5,000,000 federal contribution is included for rural low-rent housing in the first year of the program, this aid increasing in like amount for 5 years to an aggregate annual amount of $25,000,000. This money would be spent under the direction of the Department of Agriculture and the Department of Interior.

6. Extensive federal aid is provided for research and technical advancements in housing construction.

7. Federal assistance is made available to local public agencies for projects that involve mainly the remodeling, repair or reconstruction of existing buildings located in areas where the spread of blight can be prevented.

Less restriction urged

To make this housing program most effective the subcommittee recommended that the construction industry be freed at an early date of war controls and that Congress make an early study of restrictive practices within the construction industry to see what can be done to reduce construction costs.

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Canadian constructors must register

All men in Canada, between the ages of 16 and 65, who have had at least two years experience in the construction industry and who are not now engaged on construction work, must register with the Dominion Department of Labor, under the terms of an order issued by Labor Minister Humphrey Mitchell. The registration is called for by the critical shortage of skilled men in the building trades.

BUILDING CONSTRUCTION WORKERS MUST REGISTER

if not now Employed in the Construction Industry.

By Order of the Minister of Labour, made under National Selective Service Civilian Regulations, certain workers experienced in the construction industry must register on one of the days from the 6th to the 11th of August, 1945.

Those required to register include all male persons who:

(a) are either skilled or unskilled building construction tradesmen or labourers, and who are not now engaged in building construction work; and

(b) have had a total of at least two years experience continuous or otherwise, in the construction industry since December 31st, 1936; and

(c) have passed their 16th birthday but have not yet reached their 65th birthday.

Workers at present employed on building construction are not required to register under this special registration.

Registration shall be made—

1. At the nearest Local Employment Office of the National Employment Service, or

2. At the nearest Post Office if a person does not live in a city or town in which a Local Office of the National Employment Service is located, nor within 5 miles of such a city or town.

Home construction is vital to the welfare of Canada.

Returning veterans must have living accommodation.

Experienced building construction workers—whether tradesmen or labourers—are urgently required.

If you are a construction worker not now working in the construction industry, you must register as here stated—but you should do more. You should offer your services immediately for transfer to the construction industry, so that you may help in providing the homes so urgently needed.

Local Employment Offices will be open Evenings till 9:00 p.m. to take registrations, from Monday, Aug. 6th to Friday, Aug. 10th.

DEPARTMENT OF LABOUR

HUMPHREY MITCHELL, *Minister of Labour* — A. MacNAMARA, *Deputy Minister of Labour*

Valley authority held unnecessary to end Potomac River pollution

Interstate commission recommends compact method to complete abatement program—adopts tentative water-use classification—new treatment plants planned

Pollution abatement in the Potomac River Valley can best be carried out by the state compact method and to do this work a valley authority is unnecessary, the commissioners of the Interstate Commission on the Potomac River Basin declared unanimously at a two-day meeting last week at Hershey, Pa.

This view was strengthened by the fact that during the meeting the governor of Pennsylvania signed the compact under which the commission operates to make all the basin states parties to the compact. Maryland, Virginia, West Virginia and the District of Columbia have already signed.

The work of the commission was also carried another major step forward by the tentative adoption of criteria for four classes of water for the basin and a general water-use classification map for the entire Potomac River basin. Moreover, those present were encouraged by an annual report that revealed that plans were being prepared for better treatment facilities by a number of municipalities in the basin. To further advance its program the commission passed a resolution to ask the federal government through the U. S. Public Health Service to aid in evaluating the extent of the pollution in some locations and in determining the best abatement procedure to follow. This work, if approved by Congress, would be done with the assistance of the state health departments and local agencies.

Regarding the need for an authority the commission declared, "the issue of valley authorities has recently become a very controversial one in view of the many bills now before Congress setting up such agencies. This commission has opposed the idea of valley authorities because of the danger involved to our present political form of life and to the liberty of the individual. Since this commission has been created under compact of the states to promote pollution abatement within the Potomac basin, it seems fitting that steps should be taken by the commission to demonstrate the value which such a body can have in the basin-wide planning of resources which affect or are affected by pollution in cooperation with existing federal, state and local agencies and in encouraging and coordinating the efforts of such agencies."

As a result of this view, the commission unanimously approved a three-point resolution setting forth the objectives and principles to which the commission subscribes. This resolution was as follows:

(1) That a program for the solution of river basin problems, including pollution, flood control, soil conservation, reforestation, recreation, hydroelectric power development and general economic development of the water resources in the various river basins be encouraged, and initiated through the interstate compact method.

(2) That the federal government, through its existing appropriate agencies, assist the various interstate river basin commissions, upon request, by making studies and surveys in the preparation and development of plans and proposals for the solution of basin problems.

(3) That the federal government finance construction projects that cannot reasonably be construed by the states through interstate commissions. Such projects should be carried on in cooperation with the states and interstate agencies involved.

Technical work carried forward

Most important technical accomplishment at the meeting was the tentative adoption of four classes of water criteria to permit the basin to be divided into different zones and determine the necessary abatement measures for each zone. The commission also made another major step by tentatively adopting a general water-use classification for the entire basin, this latter action being taken with the understanding that major changes might be needed later after reference to and comment by the signatory states.

The four classes of minimum water quality classifications adopted, which must be formally adopted by each state, were designated A, B, C, and D, respectively. To obtain the first classification the water of a stream would need to be such that no treatment except chlorination would be necessary to permit the flow to be used for drinking purposes. Only limited areas covered with forest would be given this classification.

Class B water is that which would be suitable without treatment for bathing, fish life and recreation. Flow in the streams of more than 50 percent of the basin has this classification with the tentative zoning adopted.

Water suitable for a domestic supply after receiving complete treatment is designated Class C. Tentatively the waters of the Shenandoah Basin, the flow from a few small streams, and about 500 sq. mi. in the District of Columbia area would get this rating.

Stream flow of poor quality but sufficiently pure to prevent a public nuisance would be designated as Class D. The water in only two areas would be permitted to be of this character with the tentative classification adopted. These two areas are the major portion of the basin of the north branch of the Potomac in the Cumberland, Md., region and a smaller area in the Washington, D. C., metropolitan section.

Much work to be done

A 61-page illustrated booklet entitled "The Potomac River Basin" prepared under the direction of Edwin R. Cotton, engineer secretary of the commission, and released at the meeting shows that much work is necessary if the waters of the basin are to be improved in quality sufficiently to meet the tentative classification plan. This booklet revealed that in the 14,500-sq. mi. Potomac basin the discharge of sanitary sewage into the surface waters of the area approximates 190 mgd. Of this amount about 20 mgd. receives no treatment, 153 mgd. gets primary treatment and 17 mgd. is given secondary treatment.

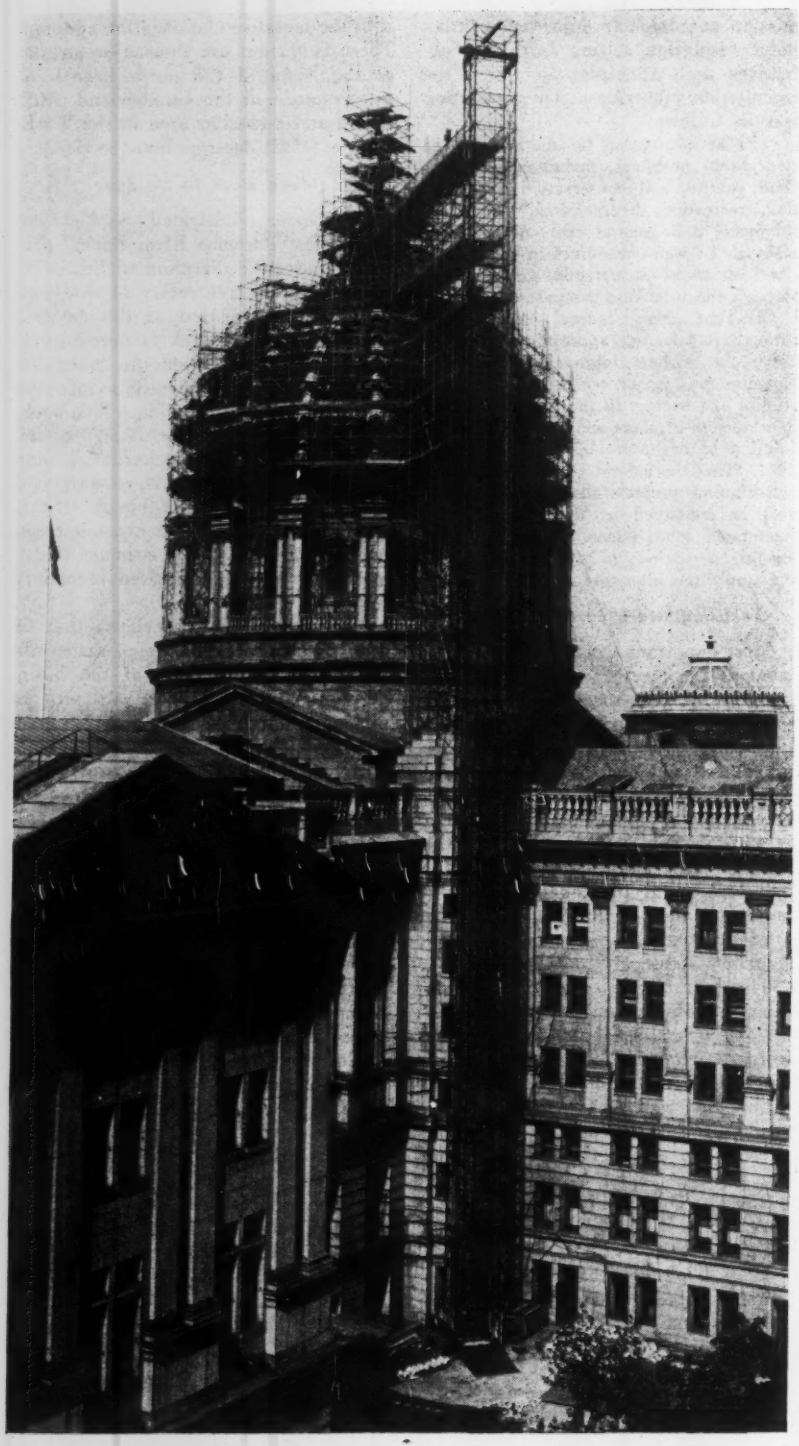
The publication also shows that 98 industries discharge their wastes directly into the streams of the basin. Of these industries, 48 plants with an estimated total discharge of 32 mgd. treat their wastes and 50 plants contributing about 21 mgd. provide no treatment. The combined load of the industries equals that from nearly half a million people.

Many new plants planned

But along with the report of the big task ahead, Secretary Cotton also revealed that many municipalities and industries were going ahead rapidly with plans to construct treatment facilities when building materials are available. Major steps to aid the abatement work are being taken as follows: Washington, D. C.—$2,500,000 of new treatment facilities; Washington Suburban Sanitary District—studies underway for treatment by District of Columbia facilities; Alexandria, Va.—trunk sewers and treatment facilities; Arlington County, Va.—extensions to existing plant; Winchester, Va.—new plant to replace existing unit of inadequate capacity; Front Royal, Va.—new treatment plant, with $135,000 addition to existing treatment facilities at American Viscose Corp.; and Waynesboro, Va.—trunk sewers and treatment plant.

Pipe Scaffold for Repair of Big Dome

Facilitating reconstruction of the central dome and cupola of Pennsylvania's capitol, which was built in 1905 at Harrisburg, steel pipe scaffolding was used extensively to provide access to all of the exterior surfaces. An unusual feature was the 270-ft. elevator tower of 1¾-in. galvanized pipe. First section to be erected, the tower was used for delivering material used in constructing the scaffold.



Around the dome were five main platforms, each 5 ft. wide, and four secondary platforms, each 3 ft. wide. The lowest platform was supported on the balcony (Fig. 1), and succeeding platforms were cantilevered inward, eliminating the need for supports on the dome and providing at least 1-ft. clearance. Above the main dome there was similar scaffolding reaching to the highest point of the finial figure. Also, a working platform was erected in the interior at the top of the interior dome, and below this was hung a dust-proof sealing platform to prevent anything from dropping to the rotunda floor 200 ft. below.

The capitol dome, 80-ft. dia., has 16 steel radial truss ribs that support both the reinforced concrete outside shell and the inside dome, which is made of reinforced concrete surfaced with ornamental plaster. The 16 exterior ribs of the dome and the cupola, or lantern, which surmounts the dome, are constructed of terra cotta. The masonry of the lantern is built around a light steel frame that supports the 16-ft. high bronze finial figure.

In recent years the terra cotta had deteriorated to such an extent that it caused many leaks, and it was found advisable to remove the terra cotta entirely, to reconstruct the ribs of wood with lead covering and to rebuild the cupola of limestone with a sheet lead roof. The tile covering between the ribs was in good condition and this was left in place.

The circular terra cotta cornice at the base of the main dome was replaced by a new granite band course. Lead through-wall flashing 6-lb. per sq. ft. was installed, to provide a watertight seal between old and new granite work.

The new exterior ribs on top of the reinforced concrete dome were constructed of wood beams and moldings shaped to the proper radius. These beams were secured to the dome structure and the top cord of the steel truss ribs with bolts. Upon this frame work was placed sheet lead in sizes not over 2 ft. x 2 ft. with locked joints.

The circular curved roof of the

Fig. 1. A steel pipe elevator tower, 270 ft. high, delivered materials used in reconstruction of dome of Pennsylvania capitol.

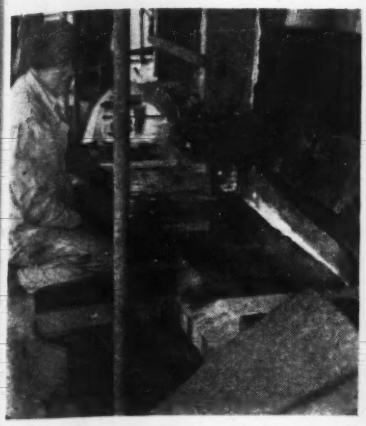


Fig. 2. New stone at base of dome was set on sheets of 6-lb. lead. The two 4 x 10-in. timbers were used in building new rib.

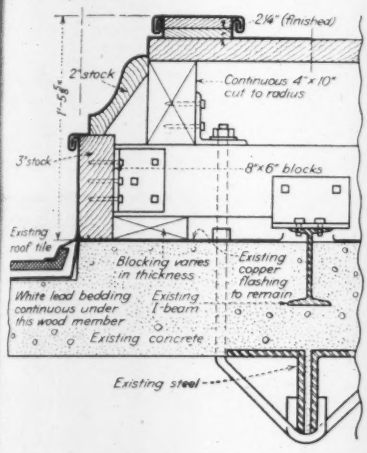


Fig. 3. In repairing cover over ribs after old terra cotta tile was removed, lead encased timbers (as shown in this half cross section detail) were bolted to steel truss ribs of roof framing.

Fig. 4. In erecting scaffolding, the pipe frame was cantilevered inward to eliminate the need for supports on the dome.

cupola, was constructed of reinforced concrete with built-in wood ribs and moldings. To this was fastened the new sheet lead roof of the cupola, from the limestone to the bronze ball surmounting figure.

Total cost of the construction work was about $162,500, of which $38,000 was for erection of the scaffolding.

This work was carried out under the direction of the Pennsylvania Department of Property & Supplies, C. M. Woolworth, secretary and A. Judson Warlow, chief engineer. The architect was William Gehron and the general contractor McCloskey & Co. of Philadelphia. For this latter firm Edward Evans was superintendent. The Cheseboro-Whitman Co. were the subcontractors for the scaffolding and Edward Linck Co. were the subcontractors for the roofing and sheet metal work.

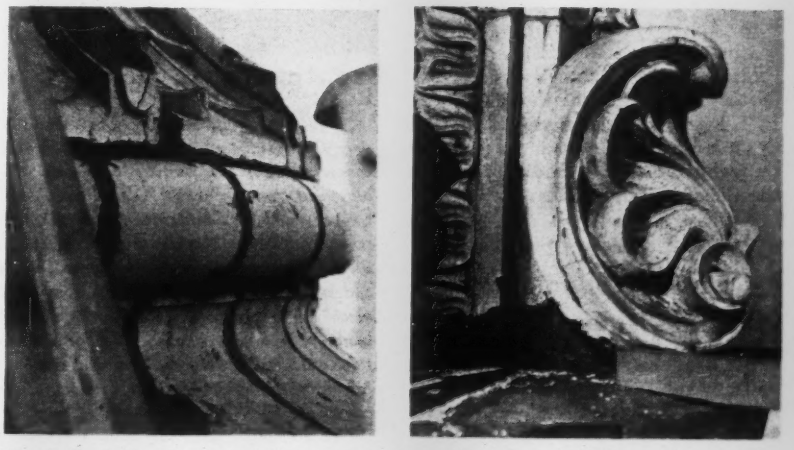


Fig. 5. Typical examples of the amount of caulking necessitated by deterioration of the terra cotta exterior.

Collective bargaining takes form in Canada

Efforts of the Federation of Employee Engineers and Assistants, which was organized under the auspices of the Association of Professional Engineers of the Province of Ontario to provide engineers with a collective-bargaining agency independent of trade unions, are beginning to take concrete form. Four groups of engineers in the federation have filed with the Ontario Labor Relations Board requests for certification of the federation as their collective-bargaining agent. All are registered professional engineers.

One group is made up of engineers on the staff of the Hydro Electric Power Commission of Ontario and the other three are made up of engineers employed in various plants of the Canadian General Electric Co. About 300 men are covered by the application.

This action is the first to be taken under a decision of the Minister of Labor of Canada authorizing engineers to organize independent units for a trial period to determine the best methods for handling their peculiar collective-bargaining problems (*ENR* Feb. 22, vol. p. 241).

In Quebec, engineers have been joined by architects, chemists and physicists in formation of the Quebec Federation of Professional Employees.

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Brownson to help U. S. in German rehousing work

Leonard E. Brownson, Jr., president of Purdy & Henderson Co. of New York and Havana, Cuba, engineers and contractors has been appointed Deputy Chief, Building Materials and Housing Branch of the economic division of the United States Group Control Council in Germany. C. S. Strike, president, F. A. McGraw & Co., Hartford, Conn., is chief of the Branch.

Mr. Brownson's firm was contractor on the construction of the $36,000,000 U. S. Naval Base at Bermuda, as well as on a number of prominent buildings throughout the West Indies, including the Cuban Capitol at Havana.

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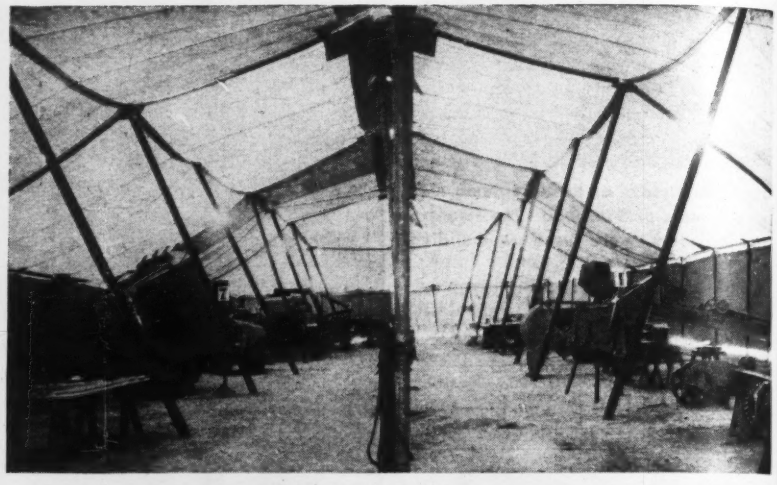
Complete building of 50-Mile Navy railroad

Built for the Navy's Bureau of Yards and Docks, a 49.63-mile railroad line has been completed between Shelton and Bangor in western Washington.

The road is to handle naval ammunition and freight for the naval magazine at Bangor with connections to the Puget Sound Navy Yard at Bremerton and the naval ammunition depot at Ostrich Bay. It diverts shipments of explosives from population centers and obviates waterfront handling formerly necessary at Seattle and Tacoma.

Cost of construction, exclusive of facilities in the Bangor magazine area, was about $8,700,000. Deepest cut on the route is 100 ft.; highest fill 85 ft.; maximum curvature 10 deg.; ruling grade, 1.5 percent, and maximum grade, 1.76 percent.

Principal construction contracts were held by the Sound-Kiewit Construction Co. and the General Construction Co., both of Seattle.



Equipment men go to school under the Big Top

"Biggest show on earth", so far as Koehring Co. engineers and service men were concerned, was the postwar equipment display and training school conducted by the company and its subsidiaries last month. The school was held in a circus tent set up on a vacant lot near the Koehring general office and main factory in Milwaukee. Complete machines as well as major parts and assemblies, completely accessible for inspection and study, were located at "stations" around the tent as well as outside in the canvas-walled "side show".

This training course for sales engineering and service men was handled by a group of expert instructors, each assigned to a particular unit or assembly. Those attending the school were divided into groups of 15 to 20 persons, each group going from class to class every half hour at the sound of a signal over the broadcasting system. The continuous change of subject and location provided variety and made close attention possible for the long and strenuous sessions.

General administration of the training school was under the direction of J. R. Steelman, vice president in charge of sales. J. F. Robbins, sales manager, was in charge of the lectures, and E. J. Goes, advertising manager, was in charge of arrangements and organized the operation of the individual sessions.

Chicago transit act upheld in court

Chicago's Transit Authority and the Illinois 1945 state legislative act creating it are constitutional in all respects, according to a recent Circuit Court ruling. To test the validity of the act, the Illinois state attorney had challenged the legality of the newly created Transit Authority and its right to issue franchises.

Also questioned were the rights of the seven board members to hold office and the power of the authority to issue bonds for the purchase and operation of the city's surface and elevated lines under public ownership. In a similar friendly action an appeal will be carried to the state supreme court whose approval is deemed necessary before investment bankers will lend the millions of dollars required to put the plan in operation.

At a meeting held early last month, the Chicago Transit Board accepted a referendum approved by city ordinance giving the Transit Authority an exclusive 50-year franchise to operate local transit service in the city. It also passed an ordinance to issue $90,000,000 in revenue bonds to purchase the Chicago Surface Lines for $75,000,000 and the Chicago Rapid Transit Company for $12,162,500.

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California flood control program now assured

California's $440,000,000 Army Engineer postwar flood control program was assured recently when Governor Earl Warren signed the Crittenden flood control measure.

Subject of long and bitter controversy throughout the recent legislative session, the bill was opposed by the Bureau of Reclamation, which was quoted as saying that the Army program would not provide "maximum conservation and full beneficial use" of the state's limited water resources.

The bill pledges state appropriations of $31,000,000 in matching funds for projects affecting 32 counties centering chiefly in southern California. It sets up a seven-man water resources board with power to recommend policies on water conservation projects. Some of the major flood control and multiple purpose projects included are the proposed Table Mountain Dam on the Sacramento River, Folson Dam on the American River and Whittier Narrows Dam on San Gabriel River (*ENR*, June 7, 1945, p. 794).

News-Record's Richardson starts his Pacific assignment

Harold W. Richardson, western editor of Engineering News-Record, just starting a tour of the Pacific warfront to report on military engineering and construction, sends back this first evidence of his activities—getting a lesson in equipment repairs on Guam from Lt. Comdr. Albert P. Hahn, in charge of the Seabees' repair depot there. Richardson's first article, to be published in the Sept. 6 issue, will describe accomplishments of Navy and Army engineers in transforming Guam into a "second Pearl Harbor" within a year after its recapture.

A seasoned reporter of military as well as civil construction work, Mr. Richardson has had several assignments out of the country. In 1942 he covered the Alcan highway work, and in 1943 he reported on the work of the Army Engineers in the Aleutians. His present assignment, when it was drawn up, called for stops at Iwo, Okinawa and the Philippines, but now, with the end of the war, may also take in Japan.

A graduate of the University of Colorado, Mr. Richardson has been on the News-Record staff since 1928, specializing on reports of major construction projects. Prior to this he was engaged on contracting work with the Bates and Rogers Construction Co. of Chicago. His coming articles will supplement News-Record's coverage of the Pacific area turned in by N. A. Bowers, Pacific Coast editor, who visited the Southwest theatre of operations in 1944.

Big improvements for Port of Boston

Gov. Maurice J. Tobin of Massachusetts has signed the Port of Boston Bill, authorizing the expenditure of $15,000,000 for the development and modernization of Boston Harbor.

The bill permits the governor to establish a new Port Authority and provides $5,000,000 to repair piers and to improve transportation and freight facilities in Boston harbor during the first year. Other funds up to $15,000,000 will be provided for use in subsequent periods.

A 4-year highway building program of $86,000,000, will get under way in Missouri after V-J day, according to Carl Brown, chief engineer for the state highway department. Plans are ready for $14,000,000 worth of work.

Condemnation denied TVA on lands for park

The United States Circuit Court of Appeals has upheld a decision of the Western North Carolina District of United States Court that the Tennessee Valley Authority can condemn land only for improvement of navigation and flood control, for which it was created, and cannot condemn land for the Great Smoky Mountain National Park.

The TVA had appealed from the district court judgments in six cases in which it sought to condemn land because the filling of the Fontana Dam reservoir flooded the only highway serving 44,400 acres housing 216 families, and the condemnation step was taken to justify the closing of the road by the State of North Carolina, the alternative to closing the road being the construction of a new highway.

Chinese, South American engineers study U. S.

Two groups of foreign engineers will soon be at work on United States highway systems and construction.

Twenty-six Chinese engineers, brought to this country under the auspices of the Foreign Economic Administration, with cooperation of the International Training Administration, Inc., and the Chinese Supply Commission, are already at work. An additional group of 500 or more Chinese trainees are expected to arrive in the near future, to make this the largest international training program of its kind ever undertaken.

After a short orientation course at Georgetown University in Washington, the trainees will be assigned to federal and state agencies and private industrial organizations for work in their particular field of study.

Meanwhile, practicing Latin-American engineers and construction men are to receive a year's special training beginning in 1946, according to Charles M. Upham, engineer-director of the American Road Builders Association. Training will consist of study and practical experience to familiarize the trainees with American construction methods, equipment, materials and specifications.

For more than 15 years, the Association through its Pan-American division, has sponsored scholarships for the training of Latin American highway engineers in this country. In conjunction with the Office of Inter-American Affairs, the U. S. Department of State, the Public Roads Administration, Pan American Highway Confederation and other agencies, the association plans to expand this training to include 20 students a year.

This plan will be administered by the Inter-American Highway Training Committee.

Caterpillar Tractor Co. photo

Moving mountains to make an airport

Some 5,000,000 cu.yd. of sandstone hills are being moved into valleys to build the Kanawah Airport near Charleston, W. Va. Three runways will be constructed 5,000 to 6,000 ft. long and surfaced 150 ft. wide.

Wheeled diesel tractors with wagons make 5½ trips per hour on 1,800 ft. haul with 6-cu.yd. load. Harrison Construction Co. of Pittsburgh are serving as the contractors on the project.

Approval sought for St. Lawrence project

Congressional approval of an agreement between the U. S. and Canadian governments providing for the construction of dams and power facilities in the international rapids section of the St. Lawrence River, and the completion of the St. Lawrence Deep Waterway is provided in a bill (S.1331) introduced recently.

The measure authorizes the President to negotiate with the State of New York for transfer to the power authority of that state of the power facilities constructed pursuant to passage of the bill; and the right to use the United States' share of the waters at the project for power purpose upon such terms and conditions as may be agreed. These terms include provision for payment of $93,375,000 to the United States by the New York authority over a 50-year period. This sum represents the cost allocated to power in accordance with the method of allocation included in the joint recommendation of the U. S. Army Engineers and the New York State Power Authority, dated Feb. 7, 1933.

The bill also calls for widespread distribution of power to public agencies in states other than New York, including counties, municipalities, public power districts and rural electric cooperatives within economic transmission distance.

Because of the recess of Congress, the bill will not come up for consideration until fall.

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Illinois' engineering act now a law

On July 20, Governor Dwight H. Green approved Illinois House Bill 337, licensing and regulating the practice of professional engineering and appropriating $55,000 to the Department of Registration and Education for the act's administration.

A full account of this legislation was given in *ENR* July 12, vol. p. 37.

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Raise R.R. board jobs

The Texas Railroad Commission has been authorized to employ an additional 24 engineers in its oil and gas division, Chairman Olin Culberson says.

Required are ten men classed as engineers at $3,000 a year each; one petroleum engineer at $3,240 a year; ten junior engineers at $3,600 a year; and three senior engineers at $4,200 a year.

ENGINEERING SCHOOL NEWS

Paul Hessemer has been appointed assistant professor in civil engineering at The Johns Hopkins University, Baltimore, Md. Professor Hessemer is a graduate in civil engineering of the Technische Hochschule at Darmstadt, Germany. He taught architectural construction at Darmstadt and later practiced architecture in Wiesbaden before coming to this country in 1923. In this country his teaching experience has been gained at the Wyomissing Polytechnic Institute and more recently at Lehigh University. Professor Hessemer replaces A. O. Babendreier whose retirement has just become effective.

This appointment signalizes the first of a number of changes in and additions to the staff to implement the report of the Committee on Postwar Plans of the School of Engineering of which Prof. J. Trueman Thompson was chairman.

Second change is promotion of Thomas F. Hubbard, from associate in civil engineering to associate professor of civil engineering. Professor Hubbard has taught at Johns Hopkins for a number of years. He is a member of the Commission on City Plan of Baltimore and has just been appointed in an advisory capacity to the Public Roads Administration as assistant to Prof. Thompson in connection with a study of the problems connected with the planning of arterial streets and highway systems in urban communities. Baltimore has been selected as the "study city."

Prof. Henry S. W. Keith, head of the department of naval architecture and marine engineering at the Massachusetts Institute of Technology, will retire Jan. 1 with the title of professor emeritus after thirty-nine years as student and teacher at the institution.

George W. Clark, associate professor of civil engineering at Ohio University, has been given a year's leave of absence to serve on the faculty of one of the university study centers planned for troops in the European theater.

Rensselaer Polytechnic Institute will receive at least $250,000 as a residuary beneficiary under the will of John Paine of Troy, N. Y. There are no restrictions as to use.

Organization of the Sanitary Engineering and Public Health Research Council of Texas, to coordinate research of colleges and public agencies of the state, has been announced at Austin.

Temporary officers are W. R. Woolrich, dean of engineering at the University of Texas, chairman; O. F. Adams, dean at Texas Technological College, Lubbock, vice chairman; and E. E. McAdams, executive secretary of the Texas League of Municipalities, Austin, secretary.

"We anticipate an extensive postwar expansion in sanitary engineering and public health work, and the council is putting itself in a position to become the agency of Texas for coordinating and sponsoring work in those fields," said Dean Woolrich.

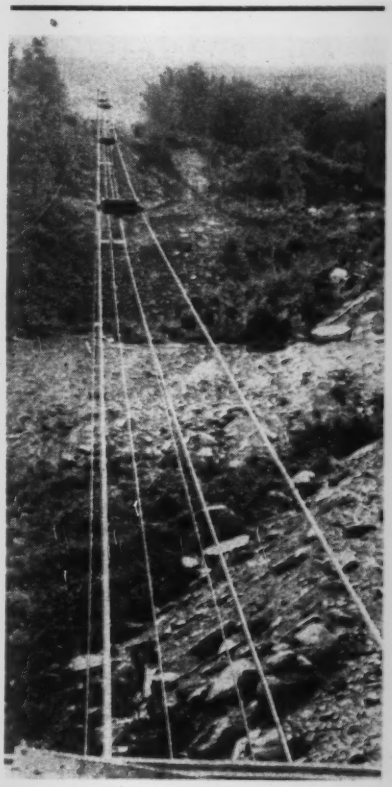
Lorenz G. Straub, professor of hydraulic engineering, Institute of Technology, University of Minnesota, has been appointed head of the Department of Civil Engineering by the Board of Regents. Alvin S. Cutler, professor of railway engineering, has been acting head of the department since the retirement of Professor Frederic Bass two years ago. Professor Cutler will now give all of his time to railway engineering.

The Maryland Board of Public Works has authorized a $4,332,000 construction, improvement and repair program for the University of Maryland. The largest single project is the construction of engineering, chemistry and physics buildings at College Park, at a cost of $750,000 to the state. The Glenn L. Martin Co. will provide an additional $1,500,000 bringing the total expenditure to $2,250,000.

The Paving Brick Institute, a national association of the manufacturers of paving brick with offices at 1756 K Street, Washington 6, D. C., is completing plans for an extensive research program at one of the midwestern universities. The program is designed to study latest technological developments in the manufacture and use of paving bricks.

There has been introduced in the House of Representatives at Washington a bill (HR 3874) to authorize an appropriation for the establishment of a geophysical institute at the University of Alaska. The amount sought is $2,000,000. The University of Alaska, at College, Alaska, has been performing geophysical research in the arctic region in cooperation with the War and Navy Departments, the Federal Communications Commission, the Coast and Geodetic Survey, the Weather Bureau and other agencies, since 1941.

Marking the first actual step since the recent announcement of a $10,000,000 campus development program at the Illinois Institute of Technology (*ENR*, June 7, vol. p. 802) ground was broken on July 13 for a $300,000 naval science building. Its completion is scheduled for next Feb. 1. Next on the agenda of construction will be a $350,000 humanities building and a $600,000 metallurgy and chemical engineering building. Construction of these two structures is expected to begin soon, according to Henry T. Heald, president of Illinois Tech.



Mile-long tramway

Shown above is a section of aerial tramway recently constructed by the Rubberoid Co. to transport asbestos-bearing rock approximately a mile from a newly opened deposit near Lowell, Vt., to the company's extracting and processing mill at Eden. The tramway delivers 2,500 tons of asbestos ore a day at capacity.

Cars are spaced at 240 ft. intervals and are loaded and dumped automatically. Operation of the tramway makes possible stockpiling a sufficient quantity of ore to permit year-round operation of the mill.

Installation was made by the Interstate Equipment Corp. of Elizabeth, N. J.

Grain elevator wrecked by explosion

An explosion, the cause of which is as yet undetermined, wrecked the large No. 5 grain elevator of the Saskatchewan Grain Pool at Port Arthur, Ont., on the morning of August 7, causing at least 16 deaths.

The elevator with a capacity of 2,000,000 bushels, built at a cost of a million and a half dollars, is one of the largest of the 29 elevators along the waterfront of the Lake Superior port. Despite the force of the explosion, nearby elevators were not damaged seriously. The explosion appears to have taken place near the top of the reinforced concrete work-house structure, adjacent to the storage bins. The top four stories were completely wrecked, and then fire broke out, causing further damage. Freight cars being unloaded were crushed by the debris; the rail access enabled railway wrecking cranes to take part in the rescue and clearance work. Investigation of the disaster is being conducted by officials of the elevator owners and the Ontario Fire Marshal's office, as well as by other government officials.

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Little further damage to Empire State found

Exposure of the steel frame of the Empire State Building in the area where it was struck by an Army B-25, Mitchell bomber, on the morning of July 28, has disclosed little additional structural damage to that reported previously (*ENR* Aug 2, vol. p. 129). One interior floor beam, brushed by an engine, was found to have been bent less than 1 in., while a falling stone ricochetting off a setback slightly bent a beam at the 6th floor level. Elevator shaft steel was also damaged by a falling engine.

Starrett Bros. & Eken are rushing the repairs. Edwards & Hjorth are consultants.

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A correction

Lieut. Gen. Raymond A. Wheeler, new commander in the India-Burma Theater, graduated from West Point in 1911, not in 1922 as stated in our issue of July 19, vol. p. 70. He was in Hawaii with the 3rd Engineers when this country enterd the last war. Later he was assigned to the 4th Engineers and sailed with that unit to France in April, 1918.

Local units in Illinois given planning funds

A new law in Illinois makes $4,850,000 available to local agencies, upon certification by the Illinois Post-War Planning Commission, for the planning of public works. This money will be distributed on the basis of population, with a $1,000 grant to each unit, and it must be matched by local funds.

Of the total, $750,000 is for counties, $3,237,500, for municipalities; $625,000, for public school districts; and $237,500 for sanitary and park districts.

For the carrying out of this act, $25,000 is appropriated to the Department of Finance and $125,000 to the Illinois Post-War Planning Commission.

According to estimates by the Illinois Municipal League, Chicago will receive, $1,098,844; Peoria, $34,964; Springfield, $25,404; East St. Louis, $25,437; Oak Park, $22,336; Evanston $22,134; Rockford, $18,355; Aurora, $16,245; Rock Island, $14,825; Quincy, $14,080.

Coal and ore dock planned for Toledo

The Baltimore & Ohio and the New York Central railroads have announced plans for joint construction of a $15,000,000 coal and ore terminal at Toledo on the east shore of Maumee Bay. Three electrically operated coal dumping machines and two ore unloading machines will be installed in the new terminal. The Interstate Commerce Commission must approve the plans before construction actually can get under way.

Toledo claims to be the largest coal loading port in the world. Last year's figure of 23,000,000 tons is expected to be increased by 10,000,000 tons when new facilities are complete.

Each railroad now operates its own plant, located on Maumee River five and seven miles respectively from the lake. Boats must pass five drawbridges to reach the present ore and coal handling facilities.

JOBS OF THE WEEK

ASSEMBLY PLANT, Detroit, Mich.

Bryant & Detwiler Co., Detroit, Mich., has been awarded a contract to build a 1-story, 281 x 1,260 ft. brick, steel concrete assembly plant for Dodge trucks by the Chrysler Corp., Highland Park, Mich., at an estimated cost of $1,500,000. Albert Kahn Associates, Detroit, Mich., are the engineers and architects.

TRUCK PLANT, Pontiac, Mich.

General Motors Truck & Coach Division, Pontiac, Mich., awarded a contract for the construction of a 1-story, 720 x 540 ft. truck addition to Cunningham-Rudy Co., Detroit, Mich. The estimated cost is $1,750,000. Albert Kahn Associates, Detroit, Mich., are the engineers and architects.

POWERHOUSE, Binghamton, N. Y.

F. H. McGraw & Co., New York, N. Y., have been awarded a contract by Ansco Film Division, General Aniline & Film Corp., Binghamton, for a 100 x 100 ft. powerhouse to cost about $1,500,000. Baker & Spencer, New York, N. Y., are the consulting engineers.

GYPSUM BOARD MILL, Mobile, Ala.

H. K. Ferguson Co., Cleveland, Ohio, will design and construct a gypsum board mill addition, for National Gypsum Co., Mobile, Ala. The estimated cost is $3,000,000.

TRUCK MANUFACTURING PLANT, South Bend, Ind.

S. N. Nielsen, Chicago, Ill., has been awarded a contract to build a 100 x 635 ft. truck manufacturing plant at about $2,500,000. Giffels & Vallet, Detroit, Mich., are the engineers.

ROAD, Mexico.

Department of Public Works, Gilbert del Arenal, director of highways, Mexico City, will construct a section of the Inter-American Highway, along Suchiate, Mexico City-Guatemala border by its own forces. The estimated cost is $10,000,000.

RAYON MANUFACTURING PLANT, Guadalajara, Mexico

Viscosa Mexicana (Celanese Corporation of America), Mexico City, will construct and operate a rayon manufacturing plant. The estimated cost is about $1,000,000.

Note—Additional bidding and contract news on many projects large and small, including the above items, appear in the Construction News section beginning on page 18.

OBITUARY

Richard A. Monroe, 77, retired senior United States engineer, who was with the government for 42 years, died July 31, at Rock Island, Ill.

Arthur King Bentley, 72, for many years a leading Milwaukee, Wis., contractor, died July 26. He was president of Bentley Bros., Inc., until his retirement in 1933. He was a past president of the Milwaukee chapter of the Associated General Contractors.

George Faltico, 56, prominent contractor of Seattle, Wash., died in that city July 28. Mr. Faltico engaged in railroad construction contracting in Minneapolis, Minn., before moving to Seattle in 1918. He was vice president of the Addison Miller Co., general contracting firm.

First Lieut. Ralph M. Blythe, Philadelphia, Pa., engineer and war prisoner of the Japanese since the fall of Bataan, lost his life when a Jap prison ship was sunk in Subic Bay. Escaping the Japanese when they invaded Manila, Lieutenant Blythe of the Corps of Engineers, landed on Bataan on Jan. 1, 1942, and was later taken prisoner. A graduate of Lehigh University, he was employed in Manila when the Japs bombed Pearl Harbor. He joined the engineers when war was declared.

Thomas S. Moore, 77, founder and president of Moretrench Corporation, manufacturers of Wellpoint System, died July 6, 1945, at Morristown, N. J. Born in Buffalo, N. Y., Mr. Moore has been identified with the construction industry as a contractor and manufacturer of construction machinery all his business life. He was best known, however, for his pioneering work in developing wellpoint systems in connection with which he held many patents. Since 1925, Mr. Moore devoted his entire time to this work and he saw widespread acceptance of wellpoint systems by the heavy construction industry and many engineers as a means of predrying wet excavations.

Andrew D. Toms, 67, construction engineer, died July 25 at Lewes, Del.

Walter R. Parvin, 53, chief engineer, maintenance of way, of the Pennsylvania Railroad's eastern region, died July 28 at Cape Charles, Va. He lived at Wynnewood, Pa. Mr. Parvin began his railroad career in 1912 while a student at the University of Pittsburgh, from which he was graduated in 1915. Prior to being promoted on Feb. 1, 1943, to the position he held at the time of his death, he served in various capacities at Pittsburgh, New York, Chicago, Altoona and Cape Charles.

Dr. Alexander H. Stewart, 65, Pennsylvania Secretary of Health and chairman of the State Sanitation Water Board died at Harrisburg, Pa., July 31. He had been in the forefront of the Boards' drive to enforce the Brunner pure-stream bill since the bill became a law. Under his chairmanship the board notified more than 500 municipalities to submit plans for sewage disposal plants before the end of this year.

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Two TVA engineers leave for private work

A. L. Pauls, chief construction engineer, and George R. Rich, chief design engineer of the Tennessee Valley Authority, have left that organization to enter private work. TVA's work is now at a stage where neither will be replaced at present. C. E. Blee, chief engineer, will handle the administrative work that cannot be delegated.

Mr. Pauls left Aug. 1 to go with Morrison-Knudsen Co., and will be in charge of their Los Angeles office. Before becoming chief construction engineer he was construction engineer at Pickwick Landing Dam and has previously served with the Miami, Ohio, Conservancy District and the Electric Bond and Share Co.

Mr. Rich left on Aug. 15 and will be associated with Charles T. Main, Inc., in Boston. He has been with TVA for several years, coming to the authority from the Corps of Engineers. Mr. Rich has had extensive experience with Stone & Webster and other well-known engineering firms.

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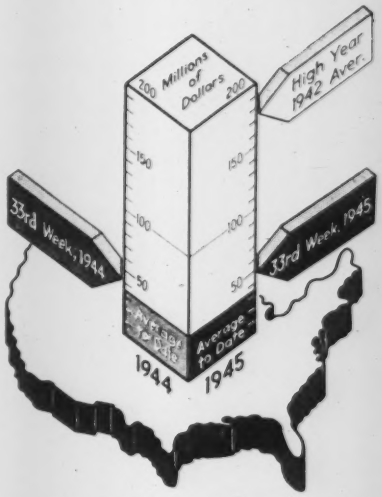
Asphalt deliveries from west coast halted

Delivery of asphalt from the West Coast States to other sections of the country were banned last week in a further effort to build up Pacific Coast petroleum stocks for military use.

Action was taken by amending a formal order which also prohibits deliveries of residual (industrial) fuel oil from the West Coast area to other points in the continental United States.

Affected by the amendment are petroleum operators in California, Oregon, Washington, Nevada and Arizona.

CONSTRUCTION ACTIVITY



As Reported This Week to... *Engineering News-Record*

CONTRACT VOLUME

Continental U. S. Only (Thousands of Dollars)

	Week of Aug. 16 1945	Cumulative 1945 (33 wk.)	Cumulative 1944 (33 wk.)
Federal	$19,143	$635,144	$747,359
State & Munic.	6,808	197,872	157,410
Total Public	$25,951	$833,016	$904,769
Total Private	23,184	369,793	259,282
U. S. Total	**$49,135**	**$1,202,809**	**$1,164,051**

WHERE CONSTRUCTION ACTIVITY ORIGINATED THIS WEEK

Dollar Volume (Thousands)

Type of Work	This Week	Cumulative 1945 (33 wk.)	Cumulative 1944 (33 wk.)
Waterworks	$3,812	$33,369	$19,604
Sewerage	1,415	20,748	19,902
Bridges	370	20,979	9,092
Highways	4,067	137,787	136,979
Earthwork, Waterways	2,454	30,758	41,102
Buildings, Public	11,577	390,226	413,347
Industrial	17,958	244,080	112,633
Commercial	4,305	76,722	107,204
Unclassified	3,177	248,140	304,188

NOTE: Minimum size projects included are: Waterworks and waterway projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1945 (33 wk.)	Cumulative 1944 (33 wk.)
NON-FEDERAL	$508,796	$318,446
Corporate Securities	93,940	86,845
State and Municipal	251,256	92,141
RFC Loans	24,600	56,460
REA Loans	60,000	20,000
Fed. Aid, Highway	79,000	63,000
FEDERAL	$1,014,412	$1,263,800
Total Capital	**$1,523,208**	**$1,582,246**

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Aug. '45	309.08	148.57
Building Cost	Aug. '45	239.94	129.70
Volume	July '45	119	52

CONSTRUCTION REPORTS

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.
ELSIE EAVES, Manager *SCOTT McLEOD, Statistics* *J. A. MAHONEY, Reports*
(Daily service also available—Write for details)

WATER SUPPLY

PROPOSED WORK

Calif., Calistoga—City, City Hall, rejected 7/27 bids, water storage tank, valves, mains and hydrants. C. C. Kennedy, 604 Mission St., San Francisco, engr. CD 8/2—ENR 8/9 under LB.

Ill., Arlington Heights—Village, well and pump house, $27,000. Consoer, Townsend & Associates, 211 Wacker Dr., Chicago, Ill., engrs.

La., New Orleans—Orleans Levee Dist., Civil Courts Bldg., rejected 8/2 bids, repair approx. 3,500 ft., steam and water pipes in sub-surface tunnel at New Orleans Airport. CD 7/24—ENR 7/26.

Tenn., Dunlap—City, City Hall, constructing WW sys., consisting of 200,000 gal. concrete reservoir and adequate c.i. mains, approx. $87,000.

Tex., Leakey—Alto Frio Baptist Encampment, 336 Bedell Blvd., San Antonio, soon lets contract, water impvs., $15,000. Plans deposit $5. H. R. F. Heiland, 904 Frost Bank Bldg., San Antonio, engr.

Wash., Tacoma—City, City Hall, replacing old pipes between S.12 and S.25 Sts. and from Lawrence to Grant and Wilkeson Sts., with c.i. watermains, $92,236. B. Bantz, city engr.

N. S., Halifax—City, pumping station, $40,000. H. W. L. Doane, 311 Roy Bldg., engr.

N. S., Sydney—City, J. MacLean, mayor, City Hall, install. watermains, about $35,000. M. Cossitt, c/o owner, engr. CD 9/14—ENR 10/19 under Postwar Projects.

Ontario—Hydro-Electric Power Comn. of Ontario, 620 University Ave., Toronto, repairing five water power projects: Wawaitin, Metabetchouan, Hound Chute, Lower Sturgeon and Indian Chutes, $85,000.

Ont., Alexandria—Municipality, water supply imprvs., $25,000. Pub. Utilities Comn., engr.

Ont., Harrow—Town, C. Davey, clk., WW sys., $45,000.

Que., Granby—Bolta Plastics Ltd., Granby, artesian well drilling and piping, $20,000.

BIDS ASKED

Bids Asked August 20

N. Y., New York—Comr. Watersupply, Gas & Electricity, Municipal Bldg., Zone 7, hauling and laying watermains and appurtenances, Logan, Jerome, Husson, Radcliff, Sacket and Vyse Aves., Whittier St. and Unionport Rd., Bronx Boro. Plans deposit $1.

Bids Asked August 21

†Ill., Mattoon—City, City Hall, waterworks, Ill. 11-343 N. **FWA.** Plans deposit $10. Wilson & Anderson, 104 W. Clark St., Champaign, engrs.

La., Colfax—R. Tumminello, mayor, City Hall Bldg., 2 water wells, equip., laying 6 in. waterline. Plans deposit $2 each. Pan American Engineers, 912 Fifth St., Alexandria, engrs. CD 6/21—ENR 7/12, under Post

Mo., Thayer—City, S. G. Skaggs, mayor, City Hall, drilling deep well, constructing pump house and appurtenant work, 200,000 gal. rein.-con. water reservoir and interconnecting piping, etc. CD 6/4—ENR 6/14.

†Pa., Phila.—Yards & Docks Annex, Navy Dpt., Arlington, Va., rehabilitating water sys., Navy Yard, NOY 12578, $100,000. Albright & Friel Inc., 1520 Locust St., engr. CD 7-30.

Wis., Luxembourg—Village, C. Ross, clk., watermains and sewers, steel elevated storage tank and tower, deep well. McMahon Engineering Co., Menasha, engr. CD 6/19—ENR 6/21.

Bids Asked August 22

Pa., Phila.—City, Dpt. P. Wks., City Hall Annex, watermains, various locations, approx. $50,000.

Bids Asked August 24

Tex., Abilene—City, c/o W. W. Hair, mayor, City Hall, constructing spillway imprvs., at Fort Phantom Hill reservoir, incl. 4,500 cu. yd. excav., 1,000 cu yd. concrete, 18,500 rein.-steel. Plans deposit $15. Freese & Nichols, Capps Bldg., Fort Worth, engrs. CD 6/21—ENR 6/28.

Bids Asked August 27

Ore., Gearhart — City, City Hall, reconstructing water distr. sys. and replacing old watermains with new c.i. pipe. Plans deposit $10. R. H. Corey, Corbett Bldg., Portland, engr. $40,000. CD 7/31—ENR 8/2.

Bids Asked August 28

Calif., San Francisco—Public Utilities Comn., City Hall, laying 24 in. steel and 12 in. c.i. mains in Pacific, Jackson and Franklin Sts., Spec. 397. Plans deposit $10. N. A. Eckart, City Hall, ch. engr.

Bids Asked September 11

N. Y., New York—Bd. Water Supply, 120 Wall St., Zone 5, Contr. 390, completion of Merriman Dam of Rondout Reservoir, in village of Lackawack, town of Wawarsing, Ulster Co.

Bids Asked September 13

Tex., Baytown—Harris Co. Water Control Dist. 7, c/o W. A. Marshall, pres., Baytown, water and sewer imprvs., Tex. 41-730-N. $75,000. J. J. Rady, Insurance Bldg., Fort Worth, engr.

Location of ENR Correspondents

Symbols and Abbreviations Include:

†	Federal Government
★	Project of $500,000 or over
ENR	Engineering News-Record
CD	Engineering, News-Record Construction Daily

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger; water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED: (except Streets & Roads): BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR);

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

LOW BIDDERS

Calif., Newport Beach—City, City Hall, Aug. 7, concrete cylinder pipe water mains from T. L. Gogo, 10024 S. Figueroa St., Los Angeles, **$53,960.** R. R. Patterson, city engr.

†Mass., Boston—Yards & Docks Annex, Navy Dpt., Arlington, Va., Aug. 6, salt water sys. at Naval Drydock, Spec. 11771, NOY 11460, from Blakeslee-Rollins Corp., 6 Beacon St., Boston, **$268,300.** CD 7/25.

Tex., Dallas—City, c/o E. Goforth, secy. City Hall, Aug. 8, c.i. water lines, Inwood Rd., from E. H. Reeder Constr. Co., 4 Glendora St., Dallas, **$.9,200.**

†Wash., Port Orchard — Public Housing Auth., NHA, Skinner Bldg., 5 and Union Sts., Seattle, Zone 1, Aug. 7, reinforcing reservoir and revisions of water sys. for housing projects Wash. 45147-217 from M. Maspina & Co., 1901 23 Ave. S., Seattle, Zone 4, **$152,096.** CD 7/18—ENR 7/26.

Wash., Seattle—City, County-City Bldg., 3 and James Sts., Zone 4, Aug. 2, c.i. water mains in 4 Ave. N.E., and other streets from M. Moschetto, 5501 13 Ave. S., Zone 8, **$59,892.** C. L. Wartelle, city engr. CD 7/28.

Wis., Lake (P. O. Milwaukee)—Town of Lake, Water Utility, 4001 S. 6 St., Zone 7, Aug. 3, structural work and piping for pumphouse, from T. Simons, 2116 E. Howard Ave., Zone 7, **$17,750.** CD 7/17—ENR 7/19.

CONTRACTS AWARDED

†Calif., Fort Ord (br. Monterey)—U. S. Eng., 74 New Montgomery St., San Francisco, Zone 19, water well, Spec. 2266-1, to Western Well Drilling Co. Ltd., 522 W. Santa Clara St., San Jose, **$17,668.**

★**†Calif., San Diego**—Yards & Docks Annex, Navy Dpt., Arlington, Va., constructing 24.5 mi. concrete pipeline and structures Mile 46.8 to Mile 71.3, San Diego Aqueduct Spec. 16954, NOY 12759, to S. A. Healy Co., 450 Hotel Stevens, Chicago, Ill., **$2,597,341.**

Ga., East Point—Central of Georgia R. R. H. F. Sharpley, ch. engr., Bay St. Extn., Savannah, concrete water tank at yards, to Tutan Constr. Co., 215 Atlantic Ave., Atlanta.

Ind., Whiteland—Town Bd., L. Asher, clk., WW imprvs., incl. pump. plant, deep well, turbine ump, distr. sys., to M. Prosser, Edinburg, est. **$72,000.** Macy-Snyder, Bellefontaine, O., engrs. Awarded 7/26.

N. C., Charlotte—City, R. W. Black, mgr., City Hall, WW addns., incl. 21,600 ft., 6 and 8 in. c.i. water pipe, 2,000 lbs. c.i. 6 and 8 in. fittings, forty 6 in. gate valves, to Lynchburg Foundry Co., Lynchburg, Va., **$17,9**. Bids 8/4.

Okla., Clinton—City, V. F. Carlton, mayor, City Hall, exten. existing WW and distr. sys., force-account, **$160,000.** C. E. Bretz Colcord Bldg., Oklahoma City, engr. CD 8/—ENR 5/10.

Ore., Warrenton—City, E. R. Baldwin, aud., City Hall, concrete dam, intake structure, wood stage pipelines and fishway on Lewis & Clark River, to Goerig & Philo, Lloyd Bldg., Seattle 1, Wash., **$24,00**. R. C. Hansen, 2301 N. Columbia Blvd., Portland, engr.

Pa., Aspinwall—City, Dpt. P. Wks., F. M. Roessing, Dir., City-County Bldg., Pittsburgh, Ross Pump. station, C-separate stack with rathbond fdn. and appurtenances, Diesel h.p. steam turbine water walls for 2-boilers to Craft Constr. Co., 215 Lathrop St., Pittsburgh, Zone 13, **$46,350.** J. D. Stevenson, City-County Bldg., engr.

★**Pa., Bellwood**—Blair Gap Water Co., 7 Morris, mgr., 15 N. 32 St., Phila., raising dam, earth fill, concrete work, to Mauger Constr. Co., 8 E. Long St., Columbus, O., about **$500,000.** CD 7/5.

Va., Culpeper—Town, Town Hall, water supply imprvs., to F. L. Showalter, Inc., Lynchburg, approx. **$100,000.** Bids 6/25. CD 6/15—ENR 6/21.

Tex., Conroe—Montgomery Housing Co., Conroe, water facilities, own forces, **$16,000.**

Tex., Victoria—City, City Hall, water supply well, pump. unit, to Layne-Texas Co., 6931 Harrisburg, Houston, **$22,102.** F. R. Lowry, Victoria, engr. CD 7/18—ENR 7/26.

B. C., Richmond—Dpt. Veterans Affairs, 518 Rogers Bldg., Vancouver, water sys., to Bennett & White Constr. Co. Ltd., 510 W. Hastings St., Vancouver, about **$25,000.**

Man., Neepawa—Town, Box 239, Neepawa, rein.-con. WW dam, to Wm. Neuman & Co., 825 Tache Ave., St. Boniface, about **$30,000.**

Man., Winnipeg—Winnipeg Municipal Hospital, Morley Ave., rein.-con. tunnel, to Winnipeg Supply & Fuel Co. Ltd., 812 Boyd Bldg., about **$18,000.**